DOCUMENT RESUME

ED 251 342 SO 016 000

AUTHOR Dow, James
TITLE The Combined Use of Computers and Audio Tape Recorders in Storing, Managing, and Using Qualitative Verbal Ethnographic Data. [Revised].
PUB DATE 21 Nov 84
NOTE 31p.; An earlier version of this paper was presented at the Annual Meeting of the American Anthropological Association (81st, Washington, DC, December 7, 1982).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Audiotape Recorders; *Computers; Computer Software; *Data Analysis; Databases; Data Collection; Data Processing; *Ethnography; Field Interviews; *Field Studies; Research Methodology; Social Science Research; Sociocultural Patterns
IDENTIFIERS Mexico; *Qualitative Research

ABSTRACT

Ways in which computers and audio tape recorder techniques were used to record, index, and present data collected during two summers of field work in a rural area of Mexico are described. The research goal was to study the Otomi Indian shamans. Two computers were used: the Honeywell 6800 DPS-2 and the Osborne-1 microcomputer. The database system chosen for the project was the Lister system for Honeywell computers operating under the Multics operating system. The Lister system, which has many of the requirements important for an ethnographic database, e.g., flexibility in formatting data and ability to store both qualitative and quantitative data, is described. The field work was paperless. Interviews were recorded on audio-cassettes and then abstracted and typed into the field computer. Field notes and translations of the shaman interviews were entered and edited on the field computer. The information was then transferred by phone line from the microcomputer disks to the large computer. An index of the abstracts was made by the large computer. Appendices, which comprise the bulk of the report, discuss computer processing details, the Lister database, and the computer programs used. (RM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED251342

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

James Dow

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

The Combined Use of Computers and Audio Tape Recorders in Storing, Managing, and Using Qualitative Verbal Ethnographic Data

JAMES DOW

Dept. of Sociology and Anthropology
Oakland University
Rochester, Mich. 48063

11/21/84

To appear in Anthropological Research: Notes and Guidelines M. D. Zamora, ed. Special Issue of the Journal of Northern Luzon, Philippines.

An earlier version of this paper was presented at the 81st Annual Meeting of the American Anthropological Association, Washington, D. C., December 7, 1982.

SP 016000

Introduction

In their article describing the first "successful" use of computer analysis to guide further data collection while still in the field," Daniela and Gerald Wineberg (1972:38) write: "Any anthropologist knows that no two aspects of science could be further apart than the orderly, rational, clean computer and the disorganized, irrational, and dirty job of field work." Now I am happy to report that the computer is getting better at doing this "dirty" job of field work. In this paper I describe an intermediate role for the computer, recording, indexing, and presenting data before a final analysis. With these methods the field worker does not have to know precisely how the data will be analyzed at the end of the project. Nevertheless the techniques shorten the time between data gathering and final analysis, and, when further computer processing is desired, the data is ready in electronic form.

A data base was recorded on a field microcomputer and later transferred by phone to a larger main-frame computer. Textual notes, abstracts of tape recorded data, and translated interviews were the main sorts of data processed; however the system can also be used for numerical data. Because computer-assisted ethnography is reaching the point at which many people might want to experiment with it, I have included information about the programs and methods in this paper. People who would like more detailed information may write me at the Department of Anthropology, Oakland University, Rochester, Michigan 48063, U. S. A.

Research Objectives

The computer and tape recorder techniques were used during two summers of field work in a rural area of the Northern Sierra de Puebla in Mexico. The goals of this research were to observe changes that had occurred over the last five years, to update a previous study of community religions, to study Otomi Indian shamans, and to establish contact with government workers for forthcoming research on economics and ecology. The reason for using audio tape recorders and computers was to save time and effort.

Equipment That Was Used

Two computers were used in this project. The first was a large Honeywell 6800 DPS-2 computer operating under the MIT-developed Multics operating system. As far as this project was

concerned, its disk storage capacity, tape storage capacity, and operating speed posed no limits whatsoever. The project relied on standard Multics software, but the software design parameters are not unlike those found many other large modern computers.

The other computer was a portable Osborne-1 microcomputer, which has 64 kilobytes of random access memory, a Z-80 microprocessor, and a CP/M operating system. The software for the field microcomputer included a word processing screen editor called Word Star, a BASIC compiler, a BASIC interpreter, and a screen calculator called Super Calc. The microcomputer was carried on rural buses in Mexico and operated without fail from rural alternating current power lines. However, the line voltage was rising to 160 volts in the evening, so a TV voltage regulator was purchased. The regulator kept the operating voltage in the vicinity of 128 and protected the computer from possible damage. Two small stereo cassette recorders were also an integral part of the equipment.

The Data Base System

The first task of computer-assisted ethnography is to create what computer specialists call a machine-readable data base. A data base is information that is structured so that it can be retrieved easily. Field notes are a kind of data base. A machine-readable data base is one that contains information that can be retrieved by computers. Computers can work on the information and make it available to humans in various forms. Computers today are programmed with a number of general systems for setting up data bases. The system chosen for this project was the Lister system for Honeywell computers operating under the Multics operating system. It was chosen as the best immediately available one for the purpose. Had the problem been a typical business record keeping data base application, however, this system would never have been chosen, for there are differences between the requirements of an ethnographic data base and the requirements of typical business data bases.

A data base usually consists of blocks of data called records. Each record is subdivided into smaller blocks called fields. The fields may be further subdivided into smaller blocks. It is usually undesirable, and sometimes a nightmare, to create a complex hierarchy of data blocks in the data base. It is undesirable because the computer has to be programmed to recognize the structure of the blocks and is forced always to respond to the data base in terms of this structure. If special symbols appearing in the data itself are used to define the data blocks, greater flexibility is achieved, for then the computer can reprogram itself as the data flows through it. This is the technique used by the Multics Lister system and many general-purpose data base systems.

The Multics Lister system uses only two levels of data blocks, records and fields, and employs special symbols in the data to identify both. A dollar sign ($) is commonly used to

delimit a record and an equal sign (=) followed by a string identifier, to identify the beginning of a field; however these special symbols may also be changed. Each type of field is given its special identifier, field name, appearing after the equal sign. Any number of fields may defined at any time with these names. The fields may appear in any order in a record. The data base may contain any number of records, and each record may contain from none up to the full compliment of fields.

Flexibility like this in formatting data is one of the important requirements of an ethnographic data base. Business-oriented data base systems have other more salient requirements. One would expect that field notes would require different formats than airline reservations, telephone bills, or student records.

What are the other requirements of an ethnographic data base besides flexibility in formatting the input? It must be able to hold quantitative as well as written data, and in general, be capable of storing many different symbols. At present the ASCII character set is minimally acceptable; however, because of the large number of human languages with which anthropologists deal, larger character sets would be useful. The data base must also have flexibility in output as well as input, so that data can be formatted in a variety of ways to serve as input to other computer programs as well as printed "reports." It should have no upper limits on the number of records or fields that are possible. It also should be modifiable by all ordinary character editing programs so that it can be set up on any computer, for example a field computer.

Since these are not necessarily the same things required of a business data base, developments in business data base software do not necessarily benefit anthropology. For example an ethnographic data base does not require constant, almost continuious, updating and retrieval of information as an airline ticket system does. It does not require that many users access the data base simultaneously, it does not require the generation of large numbers of standardized outputs like bills, receipts, etc., and it does not require frequent standardized processing of numerical data, since more sophisticated numerical data analysis is done later by other programs.

It was not advisable in our particular application to do all data base processing on the field microcomputer. The reasons were numerous: (1) little and inadequate software was available for the microcomputer, (2) it had limited disk storage, and (3) it was relatively slow. However, the field microcomputer had the great advantage of portability and availability in the field. It was decided to combine the use of the two computers to get the advantages of both. The field microcomputer was used to edit and prepare the data bases. Upon reaching reliable phone communications the information was transferred by phone line from the microcomputer disks to the large computer. A program was written for the microcomputer so that it could communicate with, and transfer files to and from large computers. When field work does not allow a return from the field every 4 months or so, different procedures may be required. In this case one would have

to have good phone or mail communications with the larger computer or do as Werner (1979, 1982) did and shift much of the processing to the field microcomputer.

To understand how the system was set up, one must know more about the particular data base system that was used. A Multics Lister data base exists in two forms, a listin form and a lister form. The listin form appears as an ordinary character file containing special characters to define records and fields. This form can be changed by any regular character editing program. Before using the data base, the listin form is transformed into the lister form, the structure of which is immaterial to the user. It is a form that can be rapidly processed by the computer. The lister form can be affected by the commands shown in Table 1. The data base information can then be put into new files with various formats determined by a format control file called a listform file. The records can be sorted and selected during this processing.

This data base system is similar to ones used for research in social history where textual and numerical data have to be combined. Unlike the SAIL textual data base described by Lipkin and Lipkin (1978), Lister has more flexible input and output formats, but it does not have the capacity for sub-fields. SAIL has been used by Sproull and Sproull (1982) to write a specialized data base, TEXTAN which can be used for recording and retrieving observational data from field settings, but its form is not as flexible as Lister. As mentioned before Lister is not like business-oriented data base systems such as GIPSY (Tracy 1978) and INFOL-2 (Leveque 1976) that are sometimes used for text-oriented social science research. These systems do not have the flexibility necessary to be useful with data that must be processed in a variety of ways which are often undetermined at the time the data is gathered. Wolf Rust and Sorrels (1980) have used SYSTEM/C in an urban applied anthropology project to coordinate human service agencies; however their data base was not designed to handle typical ethnographic research data.

The packaged programs for the Lister system can select particular records according to the contents of some field, they can sort it, and they can restructure it in any form, but this is often not enough. Therefore a way of enhancing the data manipulation is needed. The large computer has a powerful line editing program called TED which can be programmed in its own command language to make enhancements. Programming in such a language is easy, since one learns the language simply in the process of doing ordinary editing. Another string-oriented language such as SNOBOL might also be used. The TED language provided the potential for implementing new tasks as the need arose.

Interviews, Notes, and Indexes

Interviews with informants were recorded on audio cassettes. Notes including numerical data were also recorded on the same cassettes. Stereophonic recorders were used for all the research, so that when necessary, comments on earlier recordings could be added on a second track of a cassette. This feature eliminated the need for transcriptions to present to commenting informants. Such transcriptions would have been inferior to the original recordings anyhow, since most of the commenting informants were not literate. After a cassette had been recorded the contents were abstracted and typed into a note data base on the field computer. In the field, the information was recovered with the Word Star editor and a special program written in CBASIC to work with the Lister format. Upon return from the field, the note data base was electronically transferred to the large computer over telephone lines. The larger computer printed the data in a clean format and made an index of the abstracts. The index permits one to find all the material that is recorded on the audio tapes. Thus it was not necessary to make transcriptions of the tapes.

Each record of the note data base included a field indicating the unique location of the information on the cassettes. It consisted of the cassette number and the counter reading on the recorder. There was also a field for the date and time that the data was recorded. To accommodate information that was typed instead of tape recorded, a data field was included in each record. A keyword field allowed index words to be entered at any time. The field/record format of the note data base is illustrated in Figure 1. The data was sorted and printed by the large computer in a easily read format shown in Figure 2.

The index of the tapes was prepared from the abstract fields. A TED program called PUTI was written to find non trivial words in the abstracts and to attach the lines in which they appeared to the words. The location of the data on a tape cassette and the time the note was made was placed at the end of each line. These lines were sorted in TED and formatted as input to the runoff word processing program. The output of the word processing program in Figure 3 is the index of the abstracts. After each word, the line from which it came is printed, and after that, two numbers indicate the cassette location and the time the note was made. If no cassette number appears, the data is only printed, and one looks for it in printouts of printed data.

The index is a very valuable end product. It allows recovery of the original data by topics. The tapes do not have to be transcribed thus saving a great deal of work. Such a full recovery of information will raise the empirical validity of any kind of data analysis.

The Translation Data Base

At times one wants to transcribe information from audio tapes. This was the case with interviews with an important shaman informant. The shaman's part of the interviews were translated directly from the tapes and put into another data base called the translation data base. Most of the translations were made in the field and typed directly into the field computer. The goal was to assemble them into a manuscript jointly written by the investigator and the shaman. The translations would insure an accurate representation of the shaman's ideas. An illustration of the translation data base is shown in Figure 4.

The end use of this data was different from that of the note data base. It was eventually to become part of one or more manuscripts. Each record was treated as one, and sometimes more than one, paragraph of the shaman's speech. A paragraph number was added to each record. The first three digits specified a block of paragraphs in the manuscript to which it belonged, and the last three digits specified its order in this block. Thus all the paragraphs translated from two summer's field work could be reordered in any manner whatsoever. The blocks were the main units for incorporating the translations into a manuscript. They were manipulated by header labels also included in the data base. The runoff word processor locates the blocks by their labels. Any number of independent block systems may be used. So far only two have been necessary.

The procedure for setting up a book on shamanism went as follows. The paragraphs were printed out one to a page. With some additional help from keywords, they were arranged in topic groups that reflected the different themes in the shaman's thinking. The paragraphs within these groups were organized in a logical manner. Paragraphs that did not fit the schema or that contained redundant information were left out. These groups became the word-processing blocks. Another TED program called ADL (See Appendix) was used to rapidly add appropriate paragraph numbers to the data base. The runoff block labels that sorted to the head of each block were also added to the data base. A section of the translation data base can be seen in Figure 4. A final page of a manuscript incorporating parts of this data base is shown in Figure 5.

Conclusions

Some, but not all, of the useful potentials of field microcomputers mentioned by Kirk (1981) were realized. The microcomputer permitted all written data to be put into a potentially much more useful electronic form. For all practical purposes, the field work was paperless. In fact typing on a word-processing-type screen editor like Word Star is faster and easier than on a typewriter. Information was successfully retrieved in the field with the screen editor. Although the screen editor was adequate for practically all purposes, a special CBASIC program to selectively retrieve records from listin files was also written in CBASIC.

No printer was available in the field, and its lack was felt. It would have helped to integrate the work of colleagues. Since little quantitative data was collected, the capacity of the field computer to do immediate numerical processing was not utilized as it might have been (Kirk 1981:475). The stereo tape recorders eliminated the need to have transcripts of data for informants. The main anticipated advantage of the field computer, the elimination of post-field data entry, was realized. Another unanticipated advantage was that the screen editor facilitated writing publications in the field while the material was freshly in mind. The computer made this easier by allowing the manuscript to be assembled in pieces.

An experimental program was written for the field computer to allow it to record another kind of data base in a very compact form. As people may realize, the 5 and 1/4 inch single sided single density floppy disk can hold only about 90 kilobytes of information, which is really very little in relation to what most field projects in anthropology attempt to deal with. The program uses a random access disk file with all information about the fields contained in a flexibly formatted overlay file. Thus the data base does not have to contain the information about it's own structure. The system was tested but was not put into full scale operation because checks of the survey data being loaded indicated that its reliability was not up to standards that would have made computer processing useful.

Writing manuscripts in the field occurred only during the second summer of field work and was stimulated by the preliminary analysis of the shaman translations made from the first summer's field work. The discovery of the major themes in the translations and the organization of the translations around them permitted the putting together of a preliminary manuscript between the field trips. The outline of this manuscript was gradually changed on the field computer as the second summer's translations were added to the data base. Both computers helped the final manuscript evolve more quickly in more direct contact with the the data. The preliminary manuscript also helped to get funding for the second summer's field work.

The translation data base functioned well. Production of a manuscript was speeded up and its quality and reliability were improved. The translation data is now available for further analysis. For example, recently it took about 15 minutes of terminal time to assemble all paragraphs dealing with herbal medicine for a student who is planning to study the ethnobotany of the Otomí. Incidentally, the high speed line printer is used for most text output to save terminal time.

The effects of having recoverable data on original tape recordings have not yet been fully experienced. Podolefsky (1981) has noted some of the advantages of having ethnographic data recoverable by topic, such as the large-scale integration of the work of different workers, and enhanced concept formation. Since the first priority of this research was to study shamanism, the use of the note-index data base has not been fully explored.

Whenever it has been necessary to use the tape cassette data, the index has been invaluable. The tapes and index together constitute a portable data base that can be utilized by students or by other anthropologists. One unanticipated benefit was that it made the field data much more useful to other social scientists with interests unrelated to those of the ethnographer. Such a data base can be shared by a number of people in or out of the field, since both the tape cassettes and the index can be inexpensively reproduced and used without specialized equipment.

Some potential advantages of the tape-index data base are: (1) The full original verbal interaction is available. (2) Problems of selective recall or selective interview recording are eliminated. (3) No laborious transcriptions are necessary, (4) The potential recovery topics are limited only by the words and concepts used in making the abstracts. (5) Many people can use the same complete base. (6) Accessing the base does not require complex equipment or the ability to use computers. (7) The data base can be duplicated inexpensively. In summary, such a data base can be used for a wide variety of purposes, because it is very faithful to the original ethnography.

Some potential problems will occur if the volume of abstracts becomes very large. A selected list of topic words might have to be prepared from the abstracts in order to limit the size of the index. This can be done easily by persons familiar with the large computer software. On line searching of the abstracts is another way of taking care of this problem. Another problem is that the data is limited by the kind of inquiries that were originally made and by the concepts used in making the abstracts. This is more of a research design problem than a data recovery problem and should be approached at that level.

A major disadvantage of the tape and index data base is the time it takes to load a cassette and advance it to the position where the information is located. This has to be done a number of times to get the complete set of information on a particular topic. As the set is being retrieved it can be rerecorded, so that the search does not have to be done more than once. This problem could be eliminated by combining the audio data and the digital index electronically. Two methods are possible (1) recording the digital information on the second track of an audio tape, and (2) digitally encoding the audio information and retrieving it from an on-line computer. Developing and implementing either system requires some electronic engineering, and before such an effort is mounted it seems to be wise to experiment with using tape-index data bases and computerized-text data bases for a while to find out where the greatest savings of effort and methodological improvements for anthropological research can be found.

References

Kirk, Rodney C.
1981 Microcomputers in Anthropological Research. Sociological Methods and Research 9(4):473-492.

Leveque, F. H.
1976 INFOL-2: An Information Oriented Language. Software Review. Computers and the Humanities 10:122-123.

Lipkin, Joel and Bernice S. Lipkin
1978 Data Base Development and Analysis for the Social Historian: The Educational Status of the Beneficed Clergy of the Diocese of Hereford, 1289-1539. Computers and the Humanities 12:113-125.

Podolefski, Aaron
1981 Topical Sorting: A Technique for Computer Assisted Qualitative Data Management. ms.

Sproull, Lee and Robert F. Sproull
1982 Managing and Analyzing Behavioral Records: Explorations in Nonnumeric Data Analysis. Human Organization 41(4):283-290.

Tracy, Patrica A.
1978 GIPSY. Software Review. Computers and the Humanities 12:365-366.

Weinberg, Daniela and Gerald M. Weinberg
1972 Using a Computer in the Field: Kinship Information. Social Science Information 11(6):37-59.

Werner, Oswald
1979 Microcomputers in Ethnoscience Ethnographies. A paper presented at the 78th Annual Meeting of the American Anthropological Association, Cincinnati, Ohio.

Werner, Oswald
1982 Microcomputers in Cultural Anthropology: APL Programs for Qualitative Analysis. Byte, July 1982.

Wolfe, Alvin, Mary Rust, and Patricia M. Sorrells
1980 Electronic Ethnography: Human Services Information System. A paper presented at the 40th Annual Meeting of the Society for Applied Anthropology, Denver, colorado, March 22, 1980.

APPENDIX

COMPUTER PROCESSING DETAILS

TED programs (1) were written to do the following (A) make an index of significant words in a line and attach the line to each word (PUTI), (B) copy records containing a particular string, (C) copy records containing one of a list of search strings, (D) add a new word to a field if the record contains one member of a list of search strings, (E) delete a word from a field if the record contains one member of a list of search strings, and (F) add a sequence number to a record if it does not have one, (G) add a string to a field if a particular string is found in another field (ADL). The last program uses a table of search and add strings.

The appropriate listin format for converting the note data base into a redable form is shown in Figure A-1. The output of the process_list command using this format was the input to a word processing program called runoff which produced the output shown in Figure A-2. Since new formats can be generated with ease, one can make up output formats for the data base as the need arises.

The listform format used for formating the note data as input to the indexing program PUTI is shown in Figure A-3. The note data so formatted is shown in Figure A-4. The sorted output of the indexing program is shown in Figure A-5. This was input to the runoff word processor which produced an index document a page of which is shown in Figure 3.

Editing of the translation data base is performed on copies of the original data base. The following steps will produce a manuscript at any time. The data base is put into lister form. This is processed to make a word-processing input file automatically organized into blocks by sorting the records on the paragraph number. (Example command: process_list st.1.listin

---

(1) Note that in some typewritten versions of this paper certain ASCII characters must be typed in a special way, because the typewriter cannot reproduce all of them correctly. This is particularly important in the TED programs. The expression of the characters in this version, which may or may not be changed, is as follows:

Typewritten	ASCII	Typewritten	ASCII
[	same	]	same
{		}	
<		>	
^		~	
`		\	
|			

st.2.listform -sort parl -of st.runoff) The listform format is shown in Figure A-6 and an example of blocks is shown in Figure A-7. This file can then be called by another runoff file containing the rest of a manuscript. A portion of a runoff input file using these blocks is shown in Figure A-8. Note that the lines beginning with a period in Figure A-8 are non-printing commands to the runoff word-processor. For example ".pl 66" means that the page of text should contain 66 lines. The control line ".if st.pl "ethnomed" calls the block of text with the label "ethnomed" from the text block file illustrated in Figure A-7. The final output of the runoff command is shown in Figure 5.

TABLE 1

SUMMARY OF MULTICS LISTER COMMANDS

append_list	append a record to a lister file
create_list	create a lister file from a listin file
copy_list	copy selected records from one lister file to a new lister file.
describe_list	prints status information about a lister file.
display_list	prints selected fields from selected lister records.
expand_list	create a listin file from a lister file (useful for disaster recovery, or to produce a nicely formatted listin file).
merge_list	merge two lister files.
modify_list	assign a value to a field or fields in a lister record or records.
process_list	produce a document from selected records in a lister file.
sort_list	sort the records in a lister file
trim_list	delete selected records from a lister file.

FIGURE 1

NOTE AND ABSTRACT DATA BASE IN LISTIN FORM

```
Field_names:abs,tp,data,key,time,no;     ( FIELD DELIMITER NAMES )
Records:
$                                        ( RECORD DELIMITER )
=tp 820424.1 010                         ( LOCATION ON CASSETTE )
=time 820425.1855                        ( DATE.TIME NOTE MADE )
=abs Events of April 25, 1982.           ( ABSTRACT LINES
***** leaves bus.                            DESCRIBING CONTENTS )
***** ***** from Santa Monica.
Story of buying a car and getting into an accident.
***** and ***** still live in Santa Monica, but have sold thier house.
=data ***** ***** is the nephew  ( ADDITONAL WRITTEN DATA )
of ***** ***** in Santa Monica. He
says that he has some land in Santa
Monica that I can use for a house. He
wrecked a car and spent 60,000 pesos
getting his car fixed.

$                                        ( RECORD DELIMITER )
=tp 820424.1 051
=time 820426.1127
=key diary                               ( KEYWORDS )
=abs American in Tulancingo runs meat packing plant.
$
=tp 820424.1
=time 820428.0816
=key diary
=abs Events and trouble with bus getting to Tenango.
Staying in Tulancingo Monday.
Meeting ***** ***** from Santa Monica.
May fiesta in Santa Monica
Bus breaks down on way to Tenango.
***** not in Tenango when we arrive.
New restaurant in Tenango owned by
***** *****.
***** ***** sells gasoline for 7.5 pesos per liter.
*****'s children greet us.
$
=tp 820424.1 129
=time 820426.1127
=key diary ***** family
=abs *****'s children in Tenango
=data We are greeted by ***** *****'s
children when we arrive in Tenango.
There are four younger ones that were
                                  . . .
```

FIGURE A-1

LISTFORM STRUCTURE FOR CONVERTING NOTE TAPE DATA BASE INTO A READABLE FORM.

```
<Begin before:>.pl 68
.ll 40
.na
.fo '%Date%''%'
.fi
<end;>
<Begin record:>.he '<tp>''<time>'

Time note made: <time>
.br
Tape location: <tp>

Keywords: <key>

<abs>
<end;>
```

FIGURE A-3

LISTFORM FILE USED TO FORMAT INPUT TO INDEXING PROGRAM IN TED

```
<Begin record:>=1 <time>
=2 <tp>
<abs>
<end;>
```

FIGURE A-4

SAMPLE INPUT TO INDEXING PROGRAM

```
=1 820426.1
=2
data format compatable with multics
and Osborne.
=1 820430.2058
=2
***** ***** needs information on colleges.
=1 820430.2106
=2

=1 820501.2027
=2

=1 820502.1630
=2
a new system of kinship records on the computer has been established
=1 820502.1955
=2
Get ***** a trowel
=1 820503.0951
=2
organizing projects
=1 822503.1405
=2
More information needed about the festival of the cross
=1 820509.1826
=2
Things to bring in 1983 or sooner.
=1 820521.1221
=2

=1 820521.1228
=2

=1 820521.1231
=2
```

FIGURE A-5

SAMPLE OUTPUT OF INDEXING PROGRAM SORTED AND PREPARED AS INPUT TO THE WORD PROCESSOR RUNOFF

```
***** -- ***** leaves for U. S.    810707.1 535
.un 10
***** -- ***** and ***** buy clothes for *****    810705.1
133
.un 10
***** -- events of 7/9/81 and 7/10/81 *****    810707.1
447
.un 10
***** -- taking ***** to airport    810707.1 447
.un 10
***** -- interview with ***** and ***** ***** in Damo
810626.2 036
.un 10
***** -- resume conversation with ***** and ***** ***** in
Damo    810626.2 304
.un 10
*****'s -- *****'s tio    810620.2 090
.un 10
Going -- Going across the border to the United States.
820428.1928  820424.1 291
.un 10
Grandfather -- Grandfather Fire is a p incipal 534  820504.1219
820503.1 073
.un 10
Guadalupe -- Virgin of Guadalupe in Tenango    810727.2 187
.un 10
Guitar -- 012 Guitar and violin in fiesta of la cruz    820515.1 000
.un 10
Guitarra -- instruments called El Guitarra and El Violin
820515.1215  820509.1 088
.un 10
Hauchinango -- materials taken to Hauchinango shaman for cure
810626.2 304
.un 10
***** -- 6/30/81 0800 notes on INI director ***** *****
810628.2 000
.un 10
***** -- ***** ***** and work rules  820502.1129  820424.2 241
.un 10
*****'s -- *****'s children    810628.2 105
.un 10
***** -- 456 appearance of ***** *****  320530.1043
820529.1 436
.un 10
```

FIGURE 4

TRANSLATION DATA BASE IN LISTIN FORM

```
Field_names: tp,tr,key,par1,cont,no,tp1,par2;
Records:
$ =tp 810702.1 261      ( LOCATION OF ORIGINAL ON CASSETTE )
=tr This is what there is.        ( TRANSLATION OF ORIGINAL
First the limpia.                        INTO ENGLISH )
Later you begin to cure with a crystal.
.ft
The crystals are small pieces of ornamental polished glass
crystal.
They may be clear or tinted.
.ft
I have my own crystals.
After you have cured the patient with these things, and after
you see that he is getting better, you give him
medicine, such as vitamins for the body.
If the patient needs serum, give him a transfusion.
The patient will gather strength little by little.
The blood will give him strength.

=key limpia divination        ( KEYWORDS )
=no 1                         ( RECORD SEQUENCE NUMBER )
=par1 210120                  ( LOCATION IN RUNOFF BLOCK 210 )
$
                                    . . .

$ =cont .rt          ( RUNOFF CONTROL TO END BLOCK )
.la teach            ( BLOCK LABEL )
.sr teach %          ( PAGE REFERENCE FOR TABLE OF CONTENTS )
=par1 110000         ( HEAD POSITION IN BLOCK SET 1 )
=par2 220000         ( HEAD POSITION IN BLOCK SET 2 )
=no 273
$ =cont .rt
.la patient
.sr patient %
=par1 210000
=no 274
=par2 000000
$ =cont .rt
.la ethnomed
.sr ethnomed %
=par1 220000
=no 275
=par2 000000
$
```

FIGURE A-6

FORMAT FOR MAKING TEXT BLOCKS

```
<Begin before:>.ur .gf %Parameter%
<end;>
<Begin record:><cont>      <tr>
<end;>
```

FIGURE A-7

TEXT BLOCKS CALLED BY MANUSCRIPT

```
.ur .gf %Parameter%
                                    . . .
.rt
.la ethnomed
.sr ethnomed %
     I was born in *****.
A curer receives his power to cure at birth.
God implants in him an ability to diagnose
disease, and a certain sense of what
is needed for one cure or another.
Curers cannot cure "good" sicknesses, for God has made it that
way.
The doctors are there to take care of "good" sicknesses.
"Good" sicknesses can be cured with medicines or
with herbs alone.
     God selects good persons to receive his knowledge.
He rejects those who are bad.
God is on the side of the good.
For example, if a bad person grabs you and tells you he
is going to beat you up, don't believe him, for if
you have only one belief -- you should never change
your belief in God -- God will save you.
Protect yourself with a candle.
Pass it over your body in a limpia
.ft
A limpia is any ritual cleaning in which some
magical religious object is passed over and
around the body.
.ft
ritual.
Then light the candle before an image.
It could be a Virgin of Los Angeles or the Virgin
San Juanita
.ft
San Juanita refers to the Virgin, an image of the
Immaculate Conception, of the shrine at San Juan de los
Lagos in Jalisco.
.ft
or any image, even a Saint Anthony or a Saint Augustin.
     If you are a curer, never change your style.
If you change your approach,
you will never be able to cure; you will be good
only for performing sorcery.
The shaman who attacks people is given
a black censer that cannot be used for good.
```

```
:(puti)
"Ted program to put index words at the head of a line.
"Significant words are selected from regular lines and
"placed at head. The whole line follows.
"Lines beginning with =1 or =2 are placed at the end of
"lines until another = is found.
1,$k(tindex) b(tindex)
1n
:(putil) "process a line
.*/=/ {k[1]:= ""} {k[2]:= ""}
.*/^=1/ .(1,2)d (1,$-1){k[1]:=Ks} .d
.*/^=2/ .(1,2)d .(1,$-1){k[2]:=Ks} .d
.*/=/ >(puti)
.*/^ *$/ .d >(putil) "Ignore white lines
S/^/ / "Insert at least one leading blank
.(1,$-1)k(line) "Store line without <cr>
S/$/ / "Insert a trailing blank
S/  */  / "All blanks to two
"working on a regular line now
"Remove unwanted words
S/ th.. / /
S/ wh.. / /
S/ ... / /
S/ .. / /
S/ . / /
S/ ...se / /
S/ her. / /
S/ the.. / /
S/ .*ever / /
S/ .*likley / /
S/ .*fore / /
S/ .*thing / /
S/ very / /
S/ .*more / /
{a[1]:=0}
S/ \{a[1]}.* / /
zif {a[1] < 9} {a[1]:= a[1]+1} >-1
S/  */ / "All blanks to one
S/^ // "Remove leading blank
.*/^ *$/ >+5 " Is line empty?
.(1,/ /)m(word)
i \b(word)--\b(line) \{k[1]} \{k[2]}
\f
+1n >-4 "Get next word
"line now empty
^b(line) =
$ # .d >
.d  >(putil) "Not last line
```

```
:(adl)
"Changes items in field p[4] of a list in file if a string
"is found in field p[3].
"p[2] contains segment without its .listin suffix
"Results appear in a buffer with same name as p[2]
"p[3] contains the field, with =, in which the search is
"made
"p[4] contains the field which is changed.
"The search string and string to be added or change appear
"in the curren buffer. Each line conains:
"         SEARCH_STR NEW_STR
"The search string must match the entire field of p[3]
!b(\{p[2]})
# >+2
r \{p[2]}.listin
b()
1n
:(adl1)
.(1;/ /-1){K[1]:=Ks} (/  */+1;$-1){K[2]:=Ks}
!b(\{p[2]})
1n
:(adl2)
'>(adl4) $</\{p[3]} *\{K[1]}$/;$ #  >(adl5)
'>(adl4) /\{p[3]} *\{K[1]}$/ p >(adl3) "search good
>(adl2) "continue search
:(adl3) "string found
.^*/\c$/ </\c$/n "start at first line of record
\s (/\c$/+1;/\c$/) ^*|\{p[4]}| >+2 "no \{p[4]} field
.(/\c$/+1/\{p[4]}/)n ($-1)n >+2 "go to \{p[4]} field
(/\c$/+1/\c$/)i \{p[4]}\f "insert \{p[4]} field
.*/\{K[2]}/ >+3
a  \{K[2]}
\f
.\1 p /\c$/-1n >(adl2) "continue search
:(adl4)
t/\{p[3]} \{K[1]} not found in \{p[2]}/  1
:(adl5) "finished with #b(\{p[2]})
b() $ # t/Check changes in b(\{p[2]})/ 1 >
+1n >(adl1)
```

FIGURE A-2
SAMPLE PAGE OF PRINTED NOTE DATA BASE

810628.1 406

Time note made:
Tape location: 810628.1 406

Keywords:

***** brings body of *****. burial on Thursday

Time note made:
Tape location: 810628.1 436

Keywords:

my confusion about ***** family

Time note made:
Tape location: 810628.1 493

Keywords:

how ***** ***** was murdered

Time note made:
Tape location: 810628.1 526

Keywords:

***** inherits *****'s land in Damo

Time note made:
Tape location: 810628.1 556

Keywords:

straightening confusion about Damo kinship

Time note made:
Tape location: 810628.1 584

Keywords:

son-in-law of Don ***** *****, son of
***** ***** live in my ol' house in
Damo

Time note made:
Tape location: 810628.1 624

11/15/82 20

FIGURE 2

SAMPLE PAGE OF PRINTED NOTE DATA BASE
INCLUDING TEXTUAL DATA AS WELL AS ABSTRACTS

Incidentially this section of the note data base describes the field delimiters that were used in constructing it.

820424.1 010 820425.1855

Time note made: 820425.1855
Tape location: 820424.1 010

Keywords:

Events of April 25, 1982. ***** leaves bus. ***** ***** from Santa Monica. Story of buying a car and getting into an accident. ***** and ***** still live in Santa Monica, but have sold thier house.

***** ***** is the nephew of ***** ***** in Santa Monica. He says that he has some land in Santa Monica that I can use for a house. He wrecked a car and spent 60,000 pesos getting his car fixed.

Time note made: 820426.1
Tape location:

Keywords: methods data recording format field notes listin Osborne

data format compatable with multics and Osborne.

The problem of record keeping.

We need a data base system that allows both written records and tape indexes. It also should be compatable with the multics listin programs.

I am going to develop a system for multics and then see if it can be

implemented in the field on the Osborne. If we use the multics format, then some basic programs can be written for the Osborne that will allow it to be used in the field.

The following fields will be used:

tp : The location on an audio tape where the primary data resides. If this field is null, then the data is in written form in the file.

data : Written data in longest format.

FIGURE 3

SAMPLE PAGE FROM INDEX

sleep or dream 810711.2 584
dream -- you know that you will be poisoned when you dream of cats 810730.1 521
dreams -- Don ***** learned how to cure in dreams 810728.2 127
dreams -- Saint Catherine seen in dreams as a black goat 810707.2 267
dreams -- airs seen in dreams 810707.2 679
dreams -- dreams as a means of divining 810703.1 205
dreams -- dreams of shaman 810703.1 298
dreams -- in dreams the goodness or badness of disease is seen 810728.2 450
dreams -- what to do when one dreams of dead people 810707.2 600
dreams -- you have to learn these things by yourself in dreams 810728.2 295
dreams. -- airs are sudden. how airs are seen in dreams. black cows. 810711.1 011
dreams. -- learned how to call saints in dreams. 810728.2 285
dreams. -- shaman sees forms of dolls in dreams. God teaches forms of dolls 810711.2 547
dripping -- diagnosis from dripping candle 810730.3 027
drives -- boy gets up and drives car 810728.2 662
drug -- 470 Tenango drugstore will not sell ***** family medicine 820607.1454
drum -- small drum used 415 820504.1219 820503.1 078
drum -- straw drum ritual object

820504.1219 820503.1 020
drums -- doesn't know about drums or bastones 170 820506.1800 820503.2 056
ds's -- history of ds's curing experience 810730.1 065
duendes -- duendes in conversation. man with belly problem 810707.1 085
during -- 018 problem person in the oratory during merienda 820523.1200 820515.2 000
during -- 083 limpia taking place during

FIGURE A-8

SAMPLE MANUSCRIPT CALLING THE TRANSLATION BLOCKS

```
.tr {
.tr }
.ll 55
.pl 66
.ml 7
.m4 7
.ds
.nf
.na
.frf
.sr linesp %Ms%
.ss
.sp 20
.ce 2
NOTES FROM A MEXICAN INDIAN SHAMAN
                                    . . .

     A very important group of beings from whom he
gets power are the "saints."
These are not the same persons
revered by the Catholic church.  The correct word
for them in the Otomi language is zidahmu, which
means "revered great lord." Some are represented
by Catholic images but, others are represented by
stone or clay images and are called
antiguas.


.in 7
.ce
* * * * * * * * * * *


.ne 8
.if st.pl "ethnomed"


.in
.ce
* * * * * * * * * * *


.ne 8
     The above statements tell us something about
the relationship that Don ***** has with the
superhuman beings who help him in his work.
Like most shamans he communicates with these
```

FIGURE 5

SAMPLE PAGE FROM MANUSCRIPT

A shaman obtains this power by forming a relationship with supernatural beings; thus Don ***** believes that he is a good curer because he has a good relationship with the beings that help him. The following translations of Don *****'s teachings on this subject illustrate the nature of this relationship.

A very important group of beings from whom he gets power are the "saints." These are not the same persons revered by the Catholic church. The correct word for them in the Otomi language is zidahmu, which means "revered great lord." Some are represented by Catholic images but, others are represented by stone or clay images and are called antiguas.

* * * * * * * * * * * *

I was born in *****. A curer receives his power to cure at birth. God implants in him an ability to diagnose disease, and a certain sense of what is needed for one cure or another.